

*SYRINGONOMUS DACTYLATUS*, A NEW SPECIES OF  
BATHYAL MARINE NEMATODE  
(ENOPLIDA: LEPTOSOMATIDAE) AND A  
SUPPLEMENTARY DESCRIPTION  
OF *SYRINGONOMUS TYPICUS*  
HOPE AND MURPHY, 1969

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*Abstract.*—The taxonomic history of the genus *Syringonomus* is reviewed, and the genus is redefined. A supplementary description of the males of *Syringonomus typicus* is given, and *Syringonomus dactylatus* is described. The structure of the amphidial flap of the males is compared and contrasted between both species of *Syringonomus*, and between species of *Syringonomus*, *Platycoma* and *Proplatycoma*. The geographic distribution and ecology of *Syringonomus* is discussed and compared with that of *Platycoma* and *Proplatycoma*.

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The genus *Syringonomus* has, until now, contained a single species, *S. typicus* Hope & Murphy, 1969. The description of the type species was based upon specimens collected in the North Atlantic at a depth of 3806 m, which remains the only record of its occurrence. The report that *S. typicus* had been collected from near Recife, Brazil (Bongers 1983:855) is based upon misidentified specimens of the new species, *Syringonomus dactylatus*.

*Syringonomus* was assigned by Hope & Murphy (1969) to the subfamily Leptosomatinae (Leptosomatidae). However, the sexually dimorphic males of *Syringonomus* are unique among members of this subfamily in that the neck is slightly narrowed and the cuticle is thickened between the amphid and cephalic sensilla. Also, the amphids were originally described as having the shape of an "inverted lyre," with a fringed border, and with or without a tapered process directed posteriorly from the center of the anterior edge of the lyre. An amphid by this description, in fact, is not known among other marine nematodes.

The males of *Syringonomus dactylatus*, which in other regards resemble the males

of *S. typicus*, have a lobed flap, obvious even in light microscopic observations, that covers the amphidial aperture. This observation made it necessary to question the original interpretation of the amphid of *S. typicus*. Consequently, the amphid was studied with the SEM, and the results are included in the following supplementary description of the type species.

*Materials and methods.*—The original description of the males of *S. typicus* was based upon the holotype (USNM 39489) and three paratypes (USNM 39490–39492) (USNM = National Museum of Natural History). Of the three paratypes, one has been sectioned for histological examination, and another is a young male that was moulting when fixed and is in poor condition. Therefore, of the original type material, only the holotype (USNM 39489) and one paratype (USNM 39490) were used in this redescription of *S. typicus*. However, three additional males (USNM 77178–77180) have been included in this redescription. They were not part of the original type series, but were sorted, for the purposes of this study, from the same samples as those from which the type material had originally been obtained. One

Table 1.—Morphometric and meristic data for males of *Syringonomus typicus*.

USNM number	39489	39490	77178	77179	77180
Midbody diameter	83	95	—	77	100
Body width at base of esophagus	70	80	—	74	82
Body width at level of nerve ring	69	74	—	70	74
Head width at level of cephalic sensilla	32	30	22	33	28
Length of cephalic capsule on dorsal and ventral sides of head, d/v	5/3	5/4	—/—	6/5	3/2
Distance from oral surface to outer labial and cephalic sensilla	17	15	13	16	15
Length of outer labial sensilla	3,3,4,4	3,3	3,3,3,4	3,4,4,4,5	4,5
Length of cephalic sensilla	5,5,5	5,6	4,4,4,5	5,5,6,6	5,6
Number cervical sensilla anterior end to nerve ring; right/left	2/3	1/2	—/—	4/2	5/4
Length of amphidial flap, r/l	3/3	3/5	—/3	6/—	5/6
Anterior width of amphidial flap; r/l	7/7	7/7	—/4	5/—	5/5
Posterior width of amphidial flap; r/l	10/10	9/11	—/9	15/9	8/9
Length of amphidial lobes; r/l	5/5	6/5	5/4	—/3	5/6
Distance from oral surface to posterior margin of flap; r/l	27/31	27/31	—/24	32/30	32/31
Distance from oral surface to posterior end of amphidial gland (% of esophagus length); r/l	677/706 (92/96)	762/700 (107/98)	—/— —/—	840/849 (96/97)	800/792 (91/90)
Distance from oral surface to orifice of dorsal esophageal gland	43	31	—	39	34
Distance from oral surface to nerve ring	300	305	—	368	344
Length of esophagus	736	715	—	872	879
Position of testes relative to gut (v = ventral; l = left); anterior/posterior	v/l	v/l	—/—	l/l	v/l
Length of spicula; r/l	80/77	80/73	—/—	—/72	52/55
Length of lateral accessory component; r/l	14/13	—/—	—/—	15/16	11/13
Cloacal body diameter	79	83	—	88	85
Tail length	142	138	—	143	132

“—” indicates data that were not obtainable.

of these three topotype males (USNM 77178) was critical point dried for SEM by a method described elsewhere (Hope 1982: 2). The technique differs from the original in that a graded series of acetone was used for dehydration, and amyl acetate was excluded from the process. The specimen was precoated with carbon, coated with gold/palladium, and examined with an Hitachi S-570 scanning electron microscope.

The description of *S. dactylatus* is based upon specimens collected with an epibenthic sled at station 167, cruise 31 of *Atlantis II*, and donated to the National Museum of Natural History by the Woods Hole Oceanographic Institution.

All specimens of both species were fixed in 4% formalin in sea water. Those employed in light microscopic observations are mounted in anhydrous glycerin between coverslips on Cobb aluminum frames. Morphometric data were obtained by measurements from camera lucida drawings or electron micrographs. Morphometric and meristic data for each specimen of *S. typicus* are given in Table 1, and for each specimen of *S. dactylatus* in Table 2. In some cases, several data are given for one character, such as the length of each of several outer labial or cephalic sensilla, which are separated from one another by commas. The range, mean, and plus or minus one standard de-

Table 2.—Morphometric and meristic data for *Syringonomus dactylatus*.

USNM number	Males		Females		Juv
	77172	77173	77174	77175	77176
Midbody diameter	87	84	124	103	76
Body width at base of esophagus	78	79	88	82	68
Body width at level of nerve ring	70	77	70	73	59
Head width at level of cephalic sensilla	30	30	30	28	29
Length of cephalic capsule on dorsal and ventral sides of head, d/v	NA	—/3	6/4	6/5	4/5
Distance from oral surface to outer labial and cephalic sensilla	23	14	13	15	15
Length of outer labial sensilla	2,2,3,3,3	2,2,2,3	2,3,3	2,3,3,3	3,3
Length of outer cephalic sensilla	3,3,3	3,3,3,3	4,5,5	3,4,5	4,4,5
Number of cervical sensilla anterior end to nerve ring; right/left	5/3	3/4	5/3	6/5	7/6
Length of cervical sensilla	2,3	2,2	2,3,3,4	2,4	3,5
Length of amphidial flap; r/l	5/4	4/3	NA	NA	NA
Anterior width of amphidial flap; r/l	5/5	7/6	NA	NA	NA
Posterior width of amphidial flap; r/l	10/11	11/11	NA	NA	NA
Length of anterior amphidial lobes; r/l	8,8/8,8	8,8/8,8	NA	NA	NA
Length of dorsal amphidial lobes; r/l	9/9	8/6	NA	NA	NA
Length of ventral amphidial lobes; r/l	7/8	7/7	NA	NA	NA
Distance from oral surface to posterior margin of flap (males); to amphidial aperture (females); r/l	39/29	30/30	17/18	21/20	20
Distance from oral surface to posterior end of amphidial gland (% of esophagus length); r/l	846/884 (86/90)	707/740 (73/76)	NA	NA	NA
Distance from oral surface to orifice of dorsal esophageal gland	31	23	26	21	24
Distance from oral surface to nerve ring	331	333	295	307	235
Length of esophagus	988	970	851	943	673
Distance from oral surface to excretory pore	119	148	NA	NA	NA
Position of gonads relative to gut (r = right; v = ventral); anterior/posterior	v/r	r/r	v/v	v/v	NA
Length of spicula on arc; r/l	93/84	79/69	NA	NA	NA
Length of lateral accessory component; r/l	14/15	14/—	NA	NA	NA
Cloacal and anal body diameters	79	79	83	75	63
Tail length	121	123	120	103	82

NA indicates data that are not applicable; “—” indicates data that were not obtainable.

viation of the data are given in the text. The points between which the various measurements of the amphidial flaps and lobes were made is depicted in Fig. 1A and B.

*Syringonomus* Hope & Murphy, 1969  
*Syringonomus* Hope & Murphy, 1969:511.

*Type species.*—*Syringonomus typicus* Hope & Murphy, 1969:512.  
*Emended diagnosis.*—Leptosomatidae. Body elongate and spindle-shaped. Anterior

end bluntly rounded. Neck slightly reduced in width at level of amphid, slightly tapered from amphid to level of cephalic sensilla, and head rounded anteriorly from level of cephalic sensilla. Tail bluntly conical. Cuticle with fine transverse striae, at least posterior to amphid. Cuticle of neck in males thickened between level of amphids and cephalic sensilla; not thickened in females. Cephalic capsule present or absent in males; present in females. Amphidial aperture of males wide, slit-like, and covered with lobed



amphidial flap; cephalic cuticle fringed at edge of amphidial flap and outside edge of lobes. Amphid of females cyathiform with small, pore-like aperture; amphidial flap absent. Amphidial glands well developed in males, apparently absent in females. Lips short, flap-like, directed anteriorly and not set off by microlabial groove. Buccal capsule unarmed. Anterior end of esophagus attached to cephalic cuticle; cephalic cuticle at anterior end of esophagus not thickened. Oral aperture dilated by retrodilator muscles in anterior end of esophagus. Dorsal esophageal gland orifice in lumen of esophagus; subventral esophageal gland orifices apparently at anterior end of buccal capsule. Dorsolateral and ventrolateral orthometanemes present; some with, others without, caudal filaments. Spicula with paired, ventrolateral, accessory structures. Gubernaculum absent and ventromedian supplements absent. Caudal glands well developed, and extended anteriorly beyond level of cloacal and anal vents.

*Syringonomus typicus* Hope & Murphy, 1969  
Figs. 1A; 2A–C

Nec *Syringonomus typicus* sensu Bongers, 1983:855.

*Material examined.*—

*Holotype.*—Male, USNM 39489.

*Paratype.*—Male, USNM 39490.

*Topotypes.*—Males, USNM 77178, 77179 and 77180.

*Type locality.*—Sediment from epibenthic trawl collected between 39°37.0'N, 66°47.0'W and 39°37.5'N, 66°44.0'W at 3806 m on 24 Aug 1966. Although males, USNM 77178 thru 77180 are not paratype specimens, they are from the type locality.

*Supplementary description of males.*—

	a	b	c	Total length
USNM				
39489	65.9	7.3	37.9	5.377 mm

USNM				
39490	65.3	8.7	44.9	6.206 mm
USNM				
77179	89.4	7.8	47.9	6.844 mm
USNM				
77180	58.2	6.6	44.1	5.824 mm

Body elongate, gradually tapered from midbody to level of nerve ring and anal vent. Midbody diameter 77–100 ( $89 \pm 11$ )  $\mu\text{m}$ ; body width at base of esophagus 70–82 ( $77 \pm 5.5$ )  $\mu\text{m}$ , at level of nerve ring 69–74 ( $72 \pm 2.6$ )  $\mu\text{m}$ , and at level of cephalic sensilla 22–33 ( $29 \pm 4.4$ )  $\mu\text{m}$ . Cervical region slightly constricted at level of amphid, then slightly tapered to level of cephalic sensilla. Head (Fig. 2A) rounded anteriorly. Cuticle thickened at level of amphid. External surface of cuticle posteriorly from amphid with very shallow, transverse striae (Fig. 2A, C); periodicity of striae 300 nm. Cephalic capsule apparent when head viewed in optical sagittal section; length of cephalic capsule 3–6 ( $5 \pm 1.3$ ) and 2–5 ( $4 \pm 1.3$ )  $\mu\text{m}$  on dorsal and ventral sides of head respectively.

Inner labial papilliform sensilla not observed. Head with single circle of 6 setiform, outer labial sensilla and 4 setiform cephalic sensilla (Fig. 2A), 13–17 ( $15.2 \pm 1.5$ )  $\mu\text{m}$  from oral surface of head. Outer labial sensilla 3–5 ( $3.7 \pm 0.7$ )  $\mu\text{m}$  long; cephalic sensilla 4–6 ( $5.1 \pm 0.7$ )  $\mu\text{m}$  long. Cervical region between cephalic sensilla and nerve ring with 1–5 ( $3 \pm 1.8$ ) setiform sensilla on right side, and 2–4 ( $2.8 \pm 1.0$ ) on left; length of cervical sensilla ca. 4  $\mu\text{m}$ .

Cuticle at posterior rim of amphidial aperture extended anteriorly, flap-like over aperture (Figs. 1A; 2A–C); anterior end of each flap with paired, anteriorly directed, finger-like lobes (Fig. 2A–C), tapered and rounded at tip. Length of flap (Fig. 1A) on right side of head 3–6 ( $4.3 \pm 1.5$ )  $\mu\text{m}$ , and 3–6 ( $4.3 \pm 1.5$ ) on left. Width of anterior end of flap on right side of head 5–7 ( $6.0 \pm 1.2$ ), and on left side 4–7 ( $5.8 \pm 1.5$ )  $\mu\text{m}$ ; width at posterior end of flap on right side

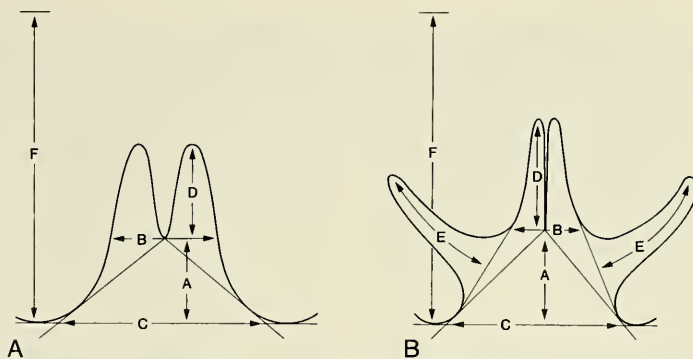


Fig. 1. Diagram showing location of measurements of the amphidial flap of 1A.) *Syringonomus typicus* and 1B.) *S. dactylatus* A. Length of flap. B. Minimum (anterior) width of flap. C. Maximum (posterior) width of flap. D. Length of central anteriorly directed lobes. E. Length of dorsal and ventral lobes. F. Distance from oral surface of head to posterior margin of flap.

of head 8–15 ( $10.5 \pm 3.1$ ), and on left 9–11 ( $9.6 \pm 0.9$ )  $\mu\text{m}$ ; length of lobes on right side of head 5–6 ( $5.3 \pm 0.5$ ), and on left 3–6 ( $4.9 \pm 0.9$ )  $\mu\text{m}$ . Distance from oral surface of head to posterior margin of flap on right side of head 27–32 ( $29.5 \pm 2.9$ ), and on left 24–31 ( $29.4 \pm 3.1$ )  $\mu\text{m}$ . Cephalic cuticle with fringed border (Fig. 2B) at edges of amphidial flaps and lobes. Amphidial glands well developed; distance from oral surface of head to posterior end of right amphidial gland (% of esophagus length) 677 (92%) to 840 (107%) ( $770 \pm 70$   $\mu\text{m}$ ;  $97 \pm 7\%$ ), and to posterior end of left amphidial gland 700 (90%) to 849 (98%) ( $762 \pm 72$   $\mu\text{m}$ ;  $95 \pm 4\%$ ). Edges of amphidial aperture dorsal and ventral from flap and lobes often with presumed secretion of amphidial gland (Fig. 2A, B).

Buccal aperture (Fig. 2C) triradiate and surrounded by 3 anteriorly directed, oral flaps (Fig. 2A, C). Anterior to posterior length of each flap greatest midway between corners of oral aperture; flaps not set off from head by groove. Buccal armature absent. Orifice of dorsal esophageal gland in cuticular wall of esophageal lumen 31–43 ( $37 \pm 5.3$ )  $\mu\text{m}$  from oral surface of head. Subventral esophageal glands apparently

with orifices at anterior end of buccal capsule.

Esophagus cylindrical, slightly narrower anteriorly; external surface of esophagus smooth. Distance from oral surface of head to anterior edge of nerve ring 300–368 ( $329 \pm 33$ )  $\mu\text{m}$ . Length of esophagus 715–879 ( $801 \pm 87$ )  $\mu\text{m}$ . Renette not observed.

Orthometanemes present at dorsal and ventral margins of lateral hypodermal chords; caudal filaments present in most metanemes, absent in others. Hypodermal glands absent.

Testes paired and opposed; testes on ventral or left side of gut. Spicula paired, curved ventrally; right spicula 52–80 ( $71 \pm 16.2$ ) and left 55–77 ( $70 \pm 8.6$ )  $\mu\text{m}$  long, measured on arc; capitulum not distinct. Lateral accessory component at distal end of each spiculum; right accessory component 11–15 ( $13 \pm 2.1$ ) and left 13–16 ( $14 \pm 1.7$ )  $\mu\text{m}$  long. Gubernaculum not apparent. Dorso-ventral copulatory muscles on each side of body separated from one another. Precaudal, subventral, setiform sensilla present; not distinguishable from somatic setae. Ventro-medial supplement absent.

Tail bluntly conical, 132–143 ( $139 \pm 5$ )  $\mu\text{m}$  long, with subdorsal and subventral se-

tiform sensilla. Cloacal body diameter 79–88 ( $84 \pm 3.9$ ). Cuticle of tail terminus with median, crescent-shaped lamella penetrated by spinneret. Cell bodies of each of 3 caudal glands extend anteriorly beyond cloacal vent.

*Syringonomus dactylatus*, new species  
Figs. 1B; 3A–C; 4A, B

*Syringonomus typicus* sensu Bongers, 1983: 855.

*Material examined.*—

*Holotype.*—Male, USNM 77172.

*Paratypes.*—Male, USNM 77173; females USNM 77174 and 77175; juvenile USNM 77176.

*Type locality.*—Approximately 52 km off coast of Recife, Brazil,  $7^{\circ}58.0' - 7^{\circ}50.0'S$ ;  $34^{\circ}17.0'W$  at a depth of 943–1007 m. Collected 20 Feb 1967.

*Description.*—

*Males.*—

	a	b	c	Total length
USNM 77172	76.3	6.7	54.3	6.613 mm
USNM 77173	78.1	6.7	53.1	6.528 mm

Body elongate, slightly tapered from mid-body to level of nerve ring and anal vent. Midbody diameter 84–87 ( $85.5 \pm 2.1$ )  $\mu\text{m}$ ; body width at base of esophagus 78–79 ( $78.5 \pm 0.7$ )  $\mu\text{m}$ , at level of nerve ring 70–77 ( $73.5 \pm 4.9$ )  $\mu\text{m}$ , and at level of cephalic sensilla 30  $\mu\text{m}$  in both specimens. Neck region (Fig. 3A) slightly constricted and cuticle thickened between level of amphid and cephalic sensilla. Thickness of cuticle posterior to amphids 4  $\mu\text{m}$ , and between amphid and cephalic sensilla 7  $\mu\text{m}$  in both specimens. Head rounded anteriorly. Cuticle posterior from head with fine transverse striae; periodicity of striae ca. 550  $\mu\text{m}$ . Cephalic cap-

sule absent in holotype (Fig. 3A), apparent only on ventral side in optical sagittal section of male paratype; length 3  $\mu\text{m}$ .

Papilliform, inner labial sensilla not observed. Outer labial sensilla and cephalic sensilla setiform (Fig. 3A) and in single circle of ten, 14–23 ( $18.5 \pm 6.4$ )  $\mu\text{m}$  from oral surface. Outer labial sensilla 2–3 ( $2.4 \pm 0.5$ )  $\mu\text{m}$  long; all cephalic sensilla in both specimens 3  $\mu\text{m}$  long. Cervical region between amphid and nerve ring with 3–5 setiform, sensory sensilla on right side of body, and 3–4 on left ( $3.8 \pm 1.0$ ); length of cervical sensilla 2–3 ( $2.3 \pm 0.5$ )  $\mu\text{m}$ .

Cuticle at posterior rim of amphidial aperture extended anteriorly, flap-like over aperture; amphidial flap (Figs. 1B; 3A) with 2 central, anteriorly directed lobes and 1 dorsal and 1 ventral lobe; dorsal and ventral lobes directed obliquely towards anterior; all lobes tapered slightly and distally rounded. Edge of aperture extended dorsally and ventrally beyond posterior end of flap. Cephalic cuticle apparently with fringe at edge of flap and lobes. Length of flap (Fig. 1B) 4–5 ( $4.5 \pm 0.7$ )  $\mu\text{m}$  on right side of head and 3–4 ( $3.5 \pm 0.7$ )  $\mu\text{m}$  on left; width of posterior end of flap 10–11 ( $10.5 \pm 0.7$ )  $\mu\text{m}$  on right, and 11  $\mu\text{m}$  on left in both specimens; width at anterior end of flap 5–7 ( $6 \pm 1.4$ )  $\mu\text{m}$  on right and 5–6 ( $5.5 \pm 0.7$ )  $\mu\text{m}$  on left; length of anterior lobes 8  $\mu\text{m}$  on both sides of both specimens; length of dorsal lobes 8–9 ( $8.5 \pm 0.7$ ) on right side and 6–9 ( $7.5 \pm 2.1$ )  $\mu\text{m}$  on left side; and length of ventral lobes 7  $\mu\text{m}$  on both specimens on right side and 7–8 ( $7.5 \pm 0.7$ )  $\mu\text{m}$  on left side. Distance from oral surface of head to posterior margin of flap 30–39 ( $34.5 \pm 6.4$ )  $\mu\text{m}$  on right side, and 29–30 ( $29.5 \pm 0.7$ )  $\mu\text{m}$  on left side. Amphidial glands (Fig. 4A) well developed; distance from oral surface of head to posterior end of gland (in  $\mu\text{m}$  and % of esophagus length) on right side 707 (73%) to 846  $\mu\text{m}$  (86%) ( $777 \pm 98$   $\mu\text{m}$ ;  $80 \pm 9\%$ ) and on left 740 (76%) to 884  $\mu\text{m}$  (90%) ( $812 \pm 102$   $\mu\text{m}$ ;  $83 \pm 10\%$ ).



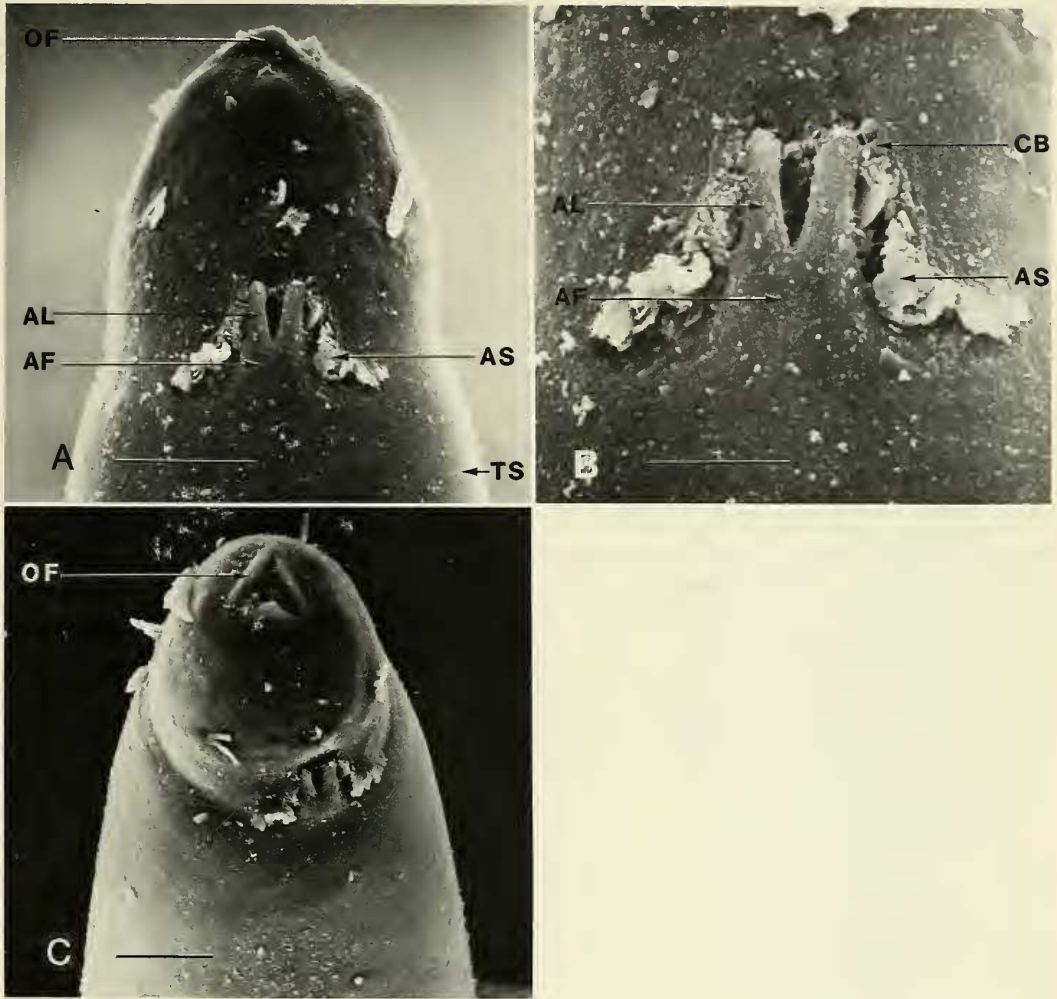


Fig. 2. *Syringonomus typicus*. Scanning electron micrographs of male topotype, USNM 77178. A. Left side of head; scale equals 10  $\mu\text{m}$ . B. Left amphidial flap; scale equals 5  $\mu\text{m}$ . C. Anterior view of head and left side of cervical region; scale equals 10  $\mu\text{m}$ . Abbreviations.—AF, amphidial flap; AL, amphidial lobe; AS, amphidial secretion; CB, fringed border of amphidial aperture; OF, oral flap; TS, transverse striae.

Buccal aperture triradiate; microlabia or oral flaps not evident in light microscopic observations (Fig. 3A). Buccal capsule triradiate and dilated by 3 obliquely oriented, labial retrodilator muscles (Fig. 3A), one in each sector of esophagus. Buccal armature absent. Orifice of dorsal esophageal gland (Fig. 3A) in lumen of esophagus 23–31 ( $27 \pm 5.7$ )  $\mu\text{m}$  from oral surface of head. Sub-

ventral esophageal glands (Fig. 3A) apparently with orifices at anterior end of buccal capsule.

Esophagus cylindrical, slightly narrower anteriorly; exterior surface of esophagus smooth. Distance from oral surface of head to anterior edge of nerve ring 331–333 ( $332 \pm 1$ )  $\mu\text{m}$ . Length of esophagus 970–988 ( $979 \pm 13$ )  $\mu\text{m}$ . Renette present and excretory

pore 119–148 ( $134 \pm 20.5$ )  $\mu\text{m}$  from oral surface of head.

Dorso- and ventrolateral orthometanemes present; some with caudal filaments, others without. Hypodermal gland cells absent.

Testes paired and opposed; testes on ventral or right of gut. Seminal vesicle straight without convolutions. Spicula (Fig. 3B) paired, curved ventrally; right spicula 79–93 ( $86 \pm 10$ ) and left 69–84 ( $77 \pm 11$ )  $\mu\text{m}$  long, measured on arc; capitulum well developed. Lateral accessory component (Fig. 3B) at distal end of each spiculum; right accessory component 14  $\mu\text{m}$  long on both specimens, and left 15  $\mu\text{m}$  on only specimen measured; distal end thick-walled and narrow; proximal end thin-walled and slightly flared. Gubernaculum not apparent. Dorsoventral copulatory muscles on each side of body (Fig. 3B) separated.

Precaudal, subventral, setiform sensilla present (Fig. 3B); not distinguishable from other somatic setae. Length of setiform supplements 1 to 3  $\mu\text{m}$  on both specimens. Ventromedian supplement absent.

Tail (Fig. 3B) bluntly conical, 121–123 ( $122 \pm 1$ )  $\mu\text{m}$  long, with dorsolateral, subventral and subterminal setiform sensilla. Cloacal body diameter 79  $\mu\text{m}$  in both specimens. Cuticle on ventral surface of tail of holotype, 85  $\mu\text{m}$  posterior from anal vent, penetrated by hypodermis without evidence of setae or glands (Fig. 3B); not observed in paratype. Cuticle of tail terminus (Fig. 3B) with median, crescent-shaped lamella penetrated by spinneret. Cell bodies of each of 3 caudal glands extend anteriorly beyond cloacal vent (Fig. 3B).

*Females.* —

	a	b	c	V	Body length
USNM					
77174	42	6	43	62%	5.156 mm
USNM					
77175	56	6	56	64%	5.791 mm

Midbody diameter 103–124 ( $114 \pm 15$ )  $\mu\text{m}$ ; body width at base of esophagus 82–

88 ( $85 \pm 4$ )  $\mu\text{m}$ , at level of nerve ring 70–73 ( $71.5 \pm 2$ )  $\mu\text{m}$ , and at level of cephalic sensilla 28–30 ( $29 \pm 1$ )  $\mu\text{m}$ . Neck region uniformly tapered; head region (Fig. 3C) slightly constricted at level of amphid, but cuticle not thickened. Head rounded anteriorly (Fig. 3C). Striae of cuticle shallow, periodicity ca. 550 nm. Cephalic capsule (Fig. 3C) apparent only in optical sagittal section of head; length of cephalic capsule on dorsal side of head 6  $\mu\text{m}$  in both specimens, and length on ventral side 4–5 ( $4.5 \pm 0.7$ )  $\mu\text{m}$ .

Papilliform, inner labial sensilla not observed. Six outer labial and 4 cephalic setiform sensilla in single circle of ten (Fig. 3C), 13 to 15 ( $14 \pm 1.4$ )  $\mu\text{m}$  from oral surface of head. Outer labial sensilla 2–3 ( $2.7 \pm 0.5$ )  $\mu\text{m}$  long; cephalic sensilla 3–5 ( $4.3 \pm 0.8$ )  $\mu\text{m}$  long. Cervical region (Fig. 4A) between amphid and nerve ring with 5 or 6 setiform sensilla on right side of body and with 3–5 ( $4 \pm 1.4$ ) on left; length of cervical sensilla 2–4 ( $3 \pm 0.9$ )  $\mu\text{m}$ . Amphid (Fig. 3C) cyathiform with pore-like aperture 17–21 ( $19 \pm 2.8$ )  $\mu\text{m}$  from oral surface on right side of head, and 18–20 ( $19 \pm 1.4$ )  $\mu\text{m}$  on left side. Amphidial flap absent; amphidial glands not evident.

Buccal cavity and anterior end of esophagus as in males. Distance from oral surface of head to orifice of dorsal esophageal gland duct (Fig. 3C) 21–26 ( $23.5 \pm 3.5$ )  $\mu\text{m}$ ; to anterior edge of nerve ring 295–307 ( $301 \pm 8.5$ )  $\mu\text{m}$ . Length of esophagus 851–943 ( $897 \pm 65$ )  $\mu\text{m}$ . Renette not observed.

Somatic sensilla uncommon between level of nerve ring and near level of cloacal vent. Dorso- and ventrolateral orthometanemes present; some with caudal filaments, others without. Hypodermal gland cells absent.

Gonoducts opposed and ovaries antidiromus. Anterior and posterior gonads ventral to gut in both specimens; both ovaries on right side of oviduct in both specimens. Tail (Fig. 4B) bluntly conical, 103–120 ( $112 \pm 12$ )  $\mu\text{m}$  long. Anal body diameter 75–83 ( $79 \pm 5.7$ )  $\mu\text{m}$ . Cuticle of tail terminus with median, crescent-shaped lamella penetrated



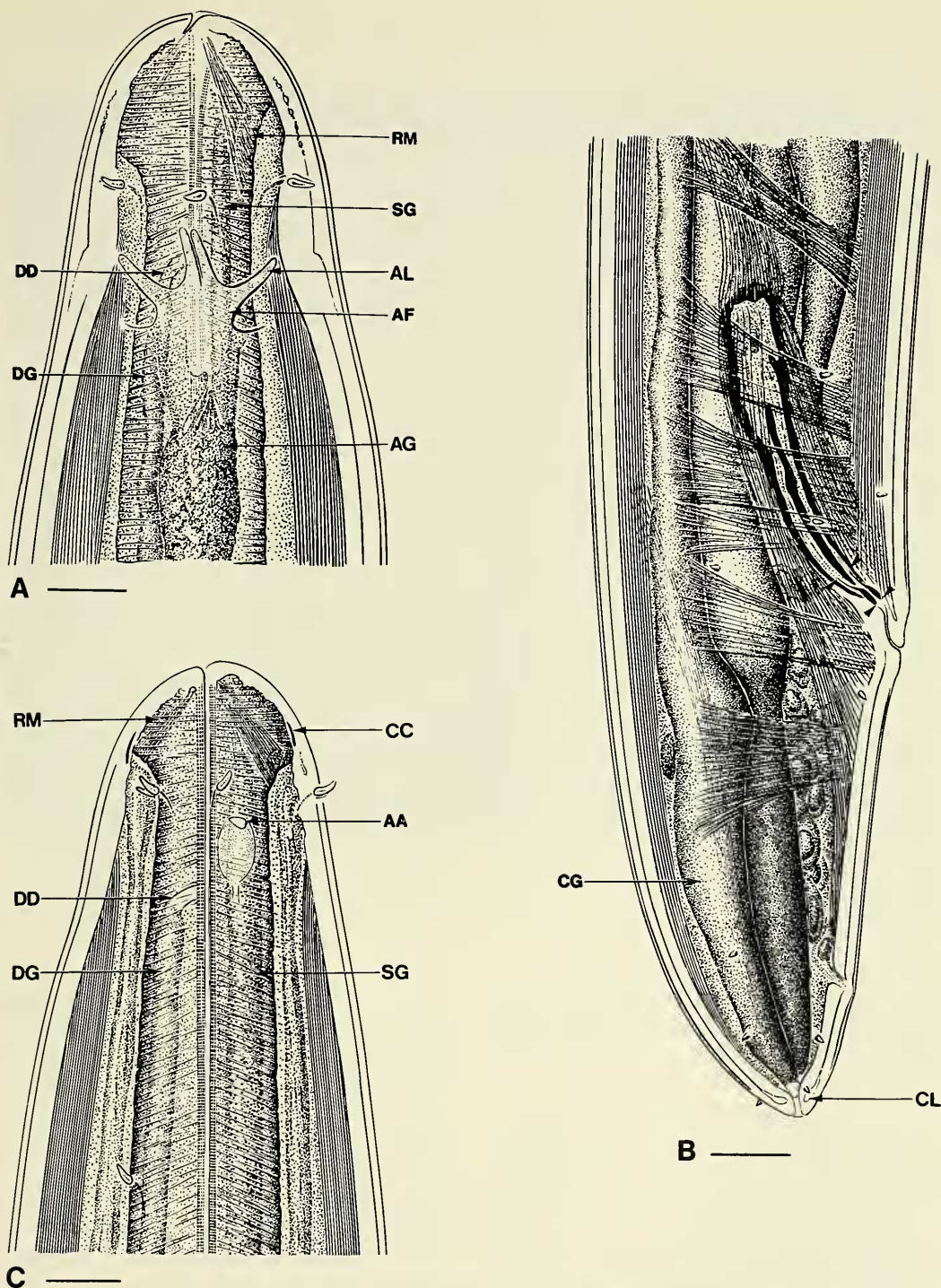


Fig. 3. *Syringonomus dactylatus*. A. Illustrated lateral view of the head of the holotype, USNM 77172; scale equals 10  $\mu$ m. B. Illustrated lateral view of the tail of the holotype, USNM 77172; lateral accessory component is situated between 4 arrow heads at distal end of spiculum; scale equals 20  $\mu$ m. C. Illustrated lateral view of the head of the female paratype USNM 77175; scale equals 10  $\mu$ m. Abbreviations.—AA, amphidial aperture; AF, amphidial flap; AG, amphidial gland; AL, amphidial lobe; CC, cephalic capsule; CG, caudal gland; CL, crescent-shaped layer of cuticle; DD, duct of dorsal esophageal gland; DG, dorsal esophageal gland; RM, retrodilator muscle; SG, subventral esophageal gland.

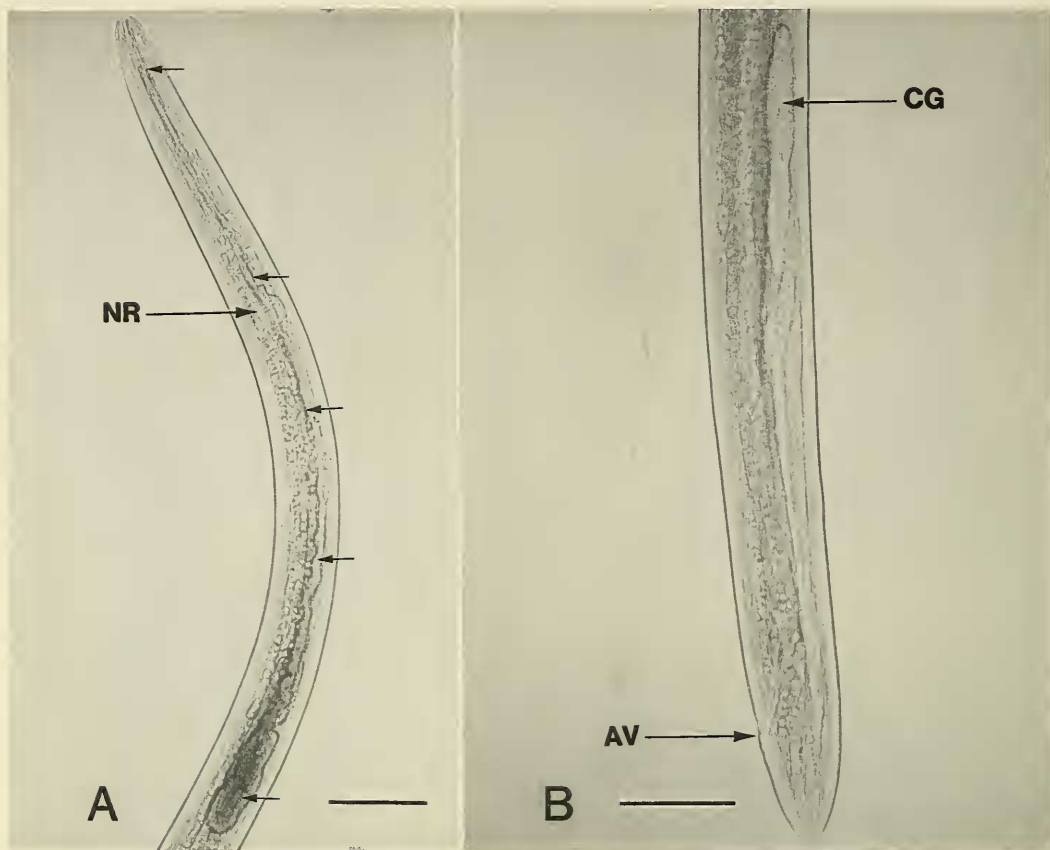


Fig. 4. *Syringonomus dactylatus*. A. Photomicrograph of the cervical region of the holotype, USNM 77172; unlabeled arrows point to amphidial gland; scale equals 100  $\mu$ m. B. Photomicrograph of the posterior body region and tail of the paratype USNM 77175; scale equals 100  $\mu$ m. Abbreviations.—AV, anal vent; CG, caudal gland; NR, nerve ring.

by spinneret. Cell bodies of each of 3 caudal glands (Fig. 4B) extend anterior beyond anal vent.

*Juvenile.*—

	a	b	c	Body length
USNM 77176	52	6	49	3.984 mm

Midbody diameter 76  $\mu$ m; body width at base of esophagus 68  $\mu$ m, at level of nerve ring 59  $\mu$ m, and at level of cephalic sensilla 29  $\mu$ m. Neck region uniformly tapered; head region not constricted nor cuticle thickened at level of amphid. Cuticle with fine trans-

verse striae; periodicity of striae ca. 500 nm. Cephalic capsule apparent on dorsal and ventral sides of head in optical sagittal section; length of cephalic capsule on dorsal side 4  $\mu$ m and on ventral side 5  $\mu$ m.

Papilliform, inner labial sensilla not observed. Six outer labial and 4 cephalic setiform sensilla in single circle of ten, 15  $\mu$ m from oral surface of head. Outer labial sensilla 3  $\mu$ m long; cephalic sensilla 4 to 5 ( $4.5 \pm 0.7$ )  $\mu$ m long. Right cervical region between amphid and nerve ring with 7 setiform sensilla, and left with 6; cervical sensilla 3 to 5 ( $4 \pm 1.4$ )  $\mu$ m long. Amphid cyathiform with pore-like aperture, 20  $\mu$ m

posterior from oral surface of head; amphidial flap absent. Amphidial glands not observed.

Buccal cavity and anterior end of esophagus as in adults. Distance from oral surface of head to orifice of dorsal esophageal gland duct  $24\text{ }\mu\text{m}$ ; to anterior edge of nerve ring  $235\text{ }\mu\text{m}$ ; to posterior end of esophagus  $673\text{ }\mu\text{m}$ . Renette not observed.

Dorso- and ventrolateral orthometanemes present, with and without caudal filaments. Hypodermal gland cells absent. Tail bluntly conical,  $82\text{ }\mu\text{m}$  long. Anal body diameter  $63\text{ }\mu\text{m}$ . Cuticle of tail terminus with median, crescent-shaped lamella penetrated by spinneret. Cell bodies of each of 3 caudal glands extend anterior beyond anal vent.

*Diagnosis.*—The males of *S. dactylatus* may be distinguished from the males of the only other species of the genus, *S. typicus*, by the presence of a dorsal and a ventral lobe on each amphidial flap.

The females of *S. dactylatus* have a body length of  $5.156\text{--}5.791$  ( $5.474 \pm 0.449$ ) mm and the esophagus is  $851\text{--}943$  ( $897 \pm 65$ )  $\mu\text{m}$ . The corresponding values for females of *S. typicus* are  $3.320\text{--}4.940$  ( $4.230 \pm 0.510$ ) mm and  $556\text{--}717$  ( $664 \pm 45$ )  $\mu\text{m}$ . Although these values are likely to overlap if obtained from larger populations, they are the only characters known at present by which the females may be distinguished from one another.

*Etymology.*—The specific epithet is Greek, masculine gender, for finger, referring to the finger-like processes of the amphidial flap.

*Discussion.*—As noted in the introduction of this work, it is stated in the original description of *S. typicus* that the amphid has the shape of an inverted lyre, with or without a posteriorly directed central process. It is apparent from the present study that the inverted lyre corresponds to the outline of the paired lobes of the flap, and the posteriorly directed process corresponds to the space between the lobes when they

are separated. The “process” is obscure when the lobes are together. Thus, the description of an inverted lyre-shaped structure was a misinterpretation of what has been demonstrated in this study to be a bilobed amphidial flap.

The misinterpretation of the amphidial flap in the original description had made it difficult to relate the structure of the amphid to that of any other taxon, especially in Leptosomatidae. From the new interpretation, it is apparent that the amphidial flaps of the males of *Syringonomus* resemble those found in males of *Platycoma* and *Proplatycoma*, (Platycominae: Leptosomatidae) in position, presence of lobes, and in that they occur in males only. In particular, the amphidial flap in males of *S. typicus*, with its paired, anteriorly directed lobes, is similar to the amphidial flap in the males of *Platycoma cephalata* Cobb, 1894. Also, the amphidial flaps of males of *S. dactylatus* are similar to those of *Proplatycoma sudafricana* Inglis, 1966 and *P. fleurdelis* Hope, 1988 in having unbranched dorsal and ventral lobes in addition to those that are central.

There are obvious differences as well. The ends of the dorsal and ventral lobes of the flaps of *P. sudafricana* and *P. fleurdelis* are directed posteriorly, whereas they are directed anteriorly in the case of *S. dactylatus*. Also, each flap in the males of each species of *Proplatycoma* has a single, anteriorly directed, central lobe, instead of the paired, central lobes that occur in the males of both species of *Syringonomus* and males of *Platycoma cephalata*. Another difference apparent from the SEM observations of *S. typicus* and *P. fleurdelis* is that the lobes of flaps in the former species have electron reflective qualities similar to those of the surrounding cephalic and cervical cuticle. By contrast, the lobes in males of *P. fleurdelis* are more electron reflective than is the cuticle of the surrounding head and neck regions (Hope 1988). Finally, there is no evi-



dence that the amphidial flaps are framed by a fringe on the cephalic cuticle, as is the case in the males of both species of *Syringonomus*.

For obvious phylogenetic reasons, it is important to determine if the amphidial flap of *Syringonomus* is homologous with that of *Platycoma* and *Proplatycoma*. Its similarity among all three genera in position, general structure, and occurrence in males only is convincing evidence that they are homologous. The differences concerned with the number, position and shape of the lobes of the amphidial flaps within *Proplatycoma*, or between *P. cephalata* on the one hand and *Proplatycoma* on the other, are similar to the differences between either genus and *Syringonomus*. Therefore, differences of this nature are not regarded as evidence against homology. The fringe bordering the amphidial flap in males of both species of *Syringonomus* is a feature of the adjacent cuticle of the neck region, and so is not concerned with the question of the homology of the flap itself. Finally, because a difference in electron reflective properties has been observed between males of *S. typicus* and males of *P. fleurdelis* only, it is at best a weak argument against homology. Therefore, it is concluded from the available evidence that the amphidial flap of *Platycoma*, *Proplatycoma*, and *Syringonomus* are homologous.

A lobed amphidial flap is not known to occur in any other taxon within the Order Enoplida, and so it is interpreted to be an apomorphic character within the family Leptosomatidae. By this character, it is assumed that *Platycoma*, *Proplatycoma*, and *Syringonomus* share a common ancestor not known to be shared by any other taxon. Males of *Proplatycoma fleurdelis* Hope, 1988, *P. sudafricana* Inglis, 1966, and both species of *Syringonomus* have prominent amphidial glands that extend to near the posterior end of the esophagus. According to Bongers (1983), the amphidial glands are enlarged in males of *Leptosomatium*, and it

may be that this is a unique (synapomorphic) character state indicative of a monophyletic relationship among the genera that share this character. However, taxonomic changes are deferred until after a more exhaustive morphological and phylogenetic analysis of Leptosomatidae.

*Distribution and ecology.*—The localities from which specimens of *S. typicus* and *S. dactylatus* have been collected are limited to their respective type localities. Therefore, representatives of this genus are at this time known to inhabit only the western North and South Atlantic, although members of the former species were collected at temperate latitudes, whereas specimens of the latter were collected at tropical latitudes. This is in contrast to the much wider distribution known for representatives of the genera *Platycoma* and *Proplatycoma* (Hope 1988). However, the apparently limited geographic distribution for the genus *Syringonomus* in comparison to *Platycoma* and *Proplatycoma* is likely to be a function of the relatively inaccessible depths inhabited by representatives of the genus *Syringonomus*.

All known specimens of *S. typicus* have been collected at 3806 m, and *S. dactylatus* at 943–1007 m. This is in contrast to all nominal species of *Proplatycoma* whose known depth distributions do not extend below the intertidal zone, and the maximum known depth for *Platycoma cephalata* Cobb, 1894, the only nominal species of the genus, is 44 m (Hope 1988). Therefore, from available data it appears that the species of *Platycoma* and *Proplatycoma* are limited to very shallow depths, whereas known species of *Syringonomus* are inhabitants of bathyal sediments.

A review of the literature has revealed that, where data is available, specimens of *Platycoma* and *Proplatycoma* inhabit fine to coarse, sandy sediment (Hope 1988). There is no published data on the sediment from the sites at which *S. typicus* and *S. dactylatus* were collected. However, accord-

ing to George Hampson of the Woods Hole Oceanographic Institution (personal communication), the sediment from station 167 of *Atlantis II*'s cruise 31 is silty mud. It is likely that the sample from which *S. typicus* was sorted also contained substantial amounts of mud given that it was collected at abyssal depths. However, the sediment from which the latter species was sorted also contained tests of the foraminiferan *Rhabdamina abyssorum*. These tests were constructed of fine particles of sand, so sand also must have been present in this sample. Although definitive data is lacking, it appears that specimens of *Syringonomus* inhabit sediments muddier than those inhabited by specimens of *Platycoma* and *Proplatycoma*. It is very possible that *S. typicus* does not in its natural environment inhabit tests of *Rhabdamina abyssorum*, but may have done so upon being sorted live from the sediment.

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#### Literature Cited

- Bongers, T. 1983. Revision of the genus *Leptosomatium* Bastian, 1865 (Nematoda: Leptosomatidae).—Proceedings of the Biological Society of Washington, 96(4):807–855.
- Hope, W. D. 1982. Structure of head and stoma in the marine nematode genus *Deontostoma* (Enoplida: Leptosomatidae).—Smithsonian Contributions to Zoology 353:1–22.
- . 1988. A review of the nematode genera *Platycoma* and *Proplatycoma*, with a description of *Proplatycoma fleurdelis*, (Enoplida: Leptosomatidae).—Proceedings of the Biological Society of Washington, 101(3):693–706.
- , & D. G. Murphy. 1969. *Syringonomus typicus* new genus, new species (Enoplida: Leptosomatidae) a marine nematode inhabiting arenaceous tubes.—Proceedings of the Biological Society of Washington 82:511–518.

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